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IMPACT OF SCREEN TIME ON ATTENTION SPANS: EXPLORING DURATION, CONTENT, AND CONTEXT ACROSS VARIOUS AGE GROUPS AND GENDERS

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ABSTRACT

Background: In the digital era, screen time has become ubiquitous in daily life, raising concerns about its potential impact on attention spans across various age groups. Existing research presents mixed findings, with some studies indicating a correlation between increased screen time and attention-related issues, particularly in children and adolescents.

Objective: This study aims to investigate the effects of different aspects of screen time, such as duration, content type, and context, on attention spans across diverse age groups, including children, adolescents, and adults, and various genders

Methods: A screen time questionnaire was created in order to quantify use of common aspects of screen time (e.g., entertainment, social media). A second, 20-question questionnaire assessing attention span was employed to understand the correlation between screen time and attention spans. The sample was stratified into distinct age groups and genders to facilitate comparative analysis.

Results: The findings indicated no significant correlation between total screen time and attention span. Additionally, different screen content types—social media, entertainment, and work/school use—showed no significant effect on attention span scores. The high p-values suggest that variations in attention span were likely due to random chance rather than screen exposure. Furthermore, gender-based analysis found no significant differences in how screen time influenced attention ($p = 0.71$).

Conclusion: These findings challenge the common belief that screen time inherently weakens attention spans. Instead, they suggest that factors beyond screen exposure, such as individual cognitive differences, multitasking habits, and environmental influences, may play a larger role in determining attention span. While concerns about excessive screen use remain relevant, this study highlights the importance of considering screen use quality over quantity.

Relevance: This research contributes to ongoing discussions about digital consumption and cognitive function, offering new perspectives for parents, educators, and policymakers on developing balanced screen time guidelines. Future research should explore objective cognitive testing, screen multitasking behaviors, and long-term effects of screen use to gain a deeper understanding of how digital engagement shapes attention.

KEYWORDS: Digitalisation, Contemporary Technologies, Contemporary Media, YouTube, Online Music Apps

INTRODUCTION

Research Background

Screen time has become a central component of modern life, with global statistics indicating that individuals spend an increasing number of hours daily engaged with digital devices. The rise of mobile technology, social media platforms, streaming services, and online gaming has diversified how and why people use screens. However, this shift has raised questions about how such pervasive screen usage influences cognitive functions like attention span.

Past studies have focused primarily on children and adolescents, often suggesting that increased screen time can negatively impact attention. For example, research has linked excessive exposure to fast-paced media with symptoms of inattention and hyperactivity in children. However, some studies also highlight the potential for certain screen-based activities, like interactive learning apps or problem-solving games, to enhance cognitive abilities.

Despite this body of work, research gaps persist:

1. **Limited Focus on Adults:** While much attention has been given to younger age groups, fewer studies have explored how screen time affects attention in adults and older populations.
2. **Overemphasis on Duration:** Many studies emphasize the quantity of screen time while neglecting the qualitative aspects, such as content type and context of use.
3. **Mixed Findings:** Findings are often contradictory, with some studies suggesting harmful effects while others highlight potential benefits.

The relationship between screen time and attention spans may be explained by cognitive theories like

1. **Cognitive Load Theory:** Suggests that exposure to high-intensity or rapidly changing content could overwhelm

working memory, leading to reduced attention capacity
2. **Neuroplasticity:** A 2021 study indicates that certain types of screen-based activities might reshape neural pathways, either positively or negatively, depending on the type and context of engagement (Neophytou et al., 2019).
3. **Age-Related Cognitive Differences:** Suggests that developmental and aging factors influence how different age groups respond to screen time (Muppalla et al., 2023).

By addressing these gaps and grounding the research in established theories, this study aims to offer a more comprehensive understanding of how screen time impacts attention spans across the lifespan.

Research Problem

While past research has looked into how screen time affects attention spans, most studies focus heavily on children and teenagers, leaving adults and older age groups underexplored. Moreover, much of the existing work zeroes in on how long people spend in front of screens rather than considering what they are watching, how they are using the screens, or the context in which they are engaged. This leaves important questions unanswered: does screen time affect attention spans differently depending on age or how the screen is used? This study addresses these gaps, aiming to provide a clearer picture of how screen time shapes attention across different stages of life. Recent studies have indicated that excessive screen time is associated with attention problems in children (Tamana et al., 2019). However the effects on adults remain unexplored.

Rationale: With screen time becoming such a big part of how we work, learn, and relax, it is vital to understand its impact, especially on our ability to focus. This study does not just look at how long people spend in front of screens but also considers what they are using them for and in what context. By exploring these factors across different age groups, we can get a better idea of whether screen time affects attention span the same way for everyone or if age and usage patterns make a difference. The insights gained can help parents, educators, and policymakers create smarter strategies to promote healthier screen habits and protect attention spans at every stage of life.

Aim of the Study: This study aims to examine the effects of screen time on attention spans across different age groups: children, adolescents, and adults. It seeks to explore not only the duration of screen exposure but also the type of content consumed and the context in which screens are used. By analyzing these factors, the research aims to identify patterns and variations in how screen time influences attention spans at different stages of life. The ultimate goal is to provide insights that can guide interventions, policies, and recommendations for healthier screen usage habits tailored to specific age groups.

Hypothesis: This study hypothesizes that screen time affects attention spans differently depending on the age group, type of content consumed, and the context in which screens are used.

1. Longer screen exposure is correlated with shorter attention spans, with a stronger effect observed in children and adolescents compared to adults.
2. Content with high levels of interactivity or rapid pacing (e.g., video games, short-form social media videos) is more likely to negatively affect attention spans than slower-paced or educational content.
3. Screen time used in structured contexts (e.g., for work or learning) has less of a negative impact, or potentially even a positive impact, on attention spans compared to unstructured, leisure-oriented use.

METHODOLOGY

Study Design: This study employed a quantitative cross-sectional design to investigate the relationship between screen time and attention spans across different age groups. The primary focus was to assess the influence of screen time duration, content type, and context on attention span levels. A survey-based approach was chosen in order to gather data on screen usage habits and the results of a self-made attention span test, with additional stratification by age groups and gender, to enable comparative analysis.

Participants

Participants were recruited using a combination of convenience and purposive sampling techniques. My sample was stratified into the following age groups to capture developmental and cognitive differences across the lifespan:

- 7-12 years
- 13-17 years
- 18-24 years
- 25-34 years
- 35-44 years
- 45-54 years
- 55 years and older

Gender Distribution: To explore potential gender-based differences in the relationship between screen time and attention spans, participants were asked to self-identify their gender during the data collection process. Gender distribution was analyzed to examine whether males and females (and any other self-identified categories) differed in screen time habits, preferences, or attention span outcomes

Inclusion Criteria

1. Regular engagement with digital devices
2. Ability to complete the surveys independently (or with the help of a parent/guardian for children under 6)

Exclusion Criteria

1. Diagnosed attention disorders or cognitive impairments that could confound results
2. Incomplete, or invalid survey responses

Instruments

1. Screen time questionnaire

A custom-designed questionnaire was developed in order to capture data on participants' screen usage patterns, including:

- Daily duration of screen time on various: time spent on specific types of screen based activities, such as social media, work or productivity tools, and entertainment services

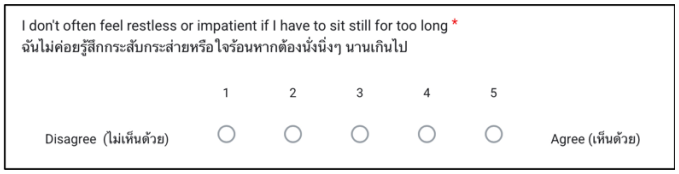
- Types of content consumed: Participants were asked to categorize their primary screen activities based on the above categories, indicating the frequency of each.

2. Attention span assessment

- Another custom-designed 20-item questionnaire was created specifically for this study to assess attention spans. This quiz was carefully developed based on existing literature on attention-related behaviors and cognitive functions. It measured various dimensions of attention, including:
- Sustained attention - The ability to focus on a single task for an extended period
- Selective attention - The ability to focus despite distractions
- Attentional control - The ability to effectively shift focus between tasks when required

Participants responded to each survey item using a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), with higher scores reflecting better attention span performance. This tailored survey design was intended to align closely with the research objectives, offering a detailed measure of screen time habits and attention spans.

The first section of the survey collected general demographic information, including age, ethnicity, and other relevant background details. Participants were assured that all demographic data would remain strictly confidential and anonymous to encourage honesty and mitigate response bias
Each non-demographical piece of data was assessed using the Likert Scale, including questions like



Subsequent sections focused on attention span assessments, evaluated through 20 targeted questions. Each item used the Likert scale for responses. The total scores derived from these questions were categorized into five levels to gauge the quality of participants' attention spans:

- 20–36: Low attention span
- 37–52: Below average
- 53–67: Average
- 68–83: Good attention span
- 84–100: Strong attention span

This scoring rubric facilitated a structured analysis of the relationship between screen time habits and attention span performance.

Data collection: Data collection occurred in two phases, both put into one questionnaire in order to study the correlation between the two variables. The survey was administered online via a secure platform (Google Forms), to ensure accessibility and convenience for participants.

Procedure

1. Ethics approval was obtained from the appropriate institutional review board prior to the study
2. The surveys were distributed electronically, and participants were given a 2-week time period to complete the survey anonymously.

Addressing Limitations

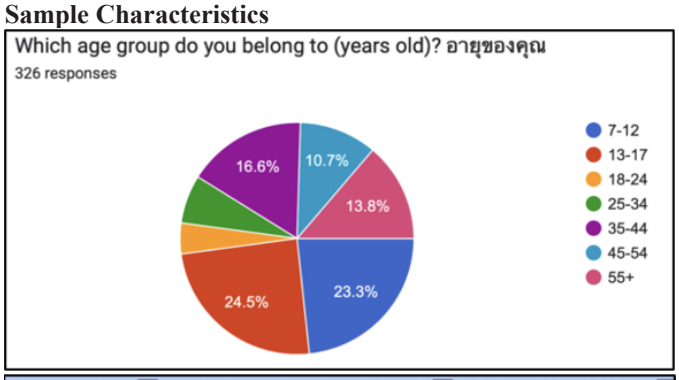
1. Self-reported data may introduce bias due to inaccurate recall or social desirability
2. Participants may not have fully understood the question or concept, leading to inaccurately reported data
3. Generalizability may be limited due to non-random sampling

Ethical Considerations

1. Participant anonymity and confidentiality were maintained
2. Data was stored securely and used exclusively for research purposes
3. Participants were informed of everything the survey would include
4. Participants were not coerced into taking part in the study
5. Participants were informed of their right to withdraw from the study at any point.

RESULTS

Sample Characteristics



Age group	Number of participants	Percentage (%)
7-12	76	23.3
13-17	80	24.5
18-24	14	4.3
25-34	22	6.7
35-44	54	16.6
45-54	35	10.7
55+	45	13.8
Total	**326**	**100**

Table 1: Participant demographics

Table 1 presents the demographic breakdown of participants by age group, with a total of 326 responses categorized into 7 age groups. The sample was fairly well-distributed, with the highest proportion of participants in the age group of '13-17' taking up 80 out of the 326 participants, and the lowest representation in '18-24'. While some variation exists, no single group dominates the sample, allowing meaningful comparisons across different stages in life.

Gender	Number of participants	Percentage (%)
Male	138	42.3
Female	181	55.5
Preferred not to say	6	1.8
Other	1	0.3
Total	326	100

Table 2: Gender Distribution

Table 2 presents the gender distribution of the study participants. The sample includes 42.3% males, 55.5% females, and 2.1% identifying as other or preferring not to disclose their gender. This diversity allows for an analysis of potential gender-based differences in screen time habits and attention span outcomes. This gender representation is well-balanced, providing a representative dataset for analyzing potential differences in screen time habits and attention across genders.

Screen Time Distribution

Age group	Mean Screen Time (hours)	Standard Deviation
7-12	5.23	2.97
13-17	7.34	3.82
18-24	12.54	4.07
25-34	9.93	4.46
35-44	10.24	3.86
45-54	9.99	4.35
55+	7.22	3.58

Table 3: Average daily screen time by age group

Table 3 presents the average daily screen time across age groups. Young adults (18-24 years) reported the highest screen time, with a mean of 12.53 hours per day (SD = 4.06), followed by the 35-44 (10.24 hours, SD = 3.85) and 25-34 (9.93 hours, SD = 4.46) age groups. In contrast, children aged 7-12 reported the lowest average screen time (5.23 hours, SD = 2.97), with a gradual increase observed in adolescence (7.34 hours, SD = 3.82). Older adults (55+) reported an average screen time of 7.22 hours per day, slightly lower than the adolescent group. These findings suggest that screen time peaks in young adulthood and then slightly declines with age, though middle-aged adults (35-44) still maintain high screen engagement. The variation in screen time across age groups and higher standard deviations in young adults and middle-aged groups suggest greater variability in screen groups, likely reflecting differences in work, education, and recreational screen use patterns.

Age group	Social media	Work/school	Entertainment
7-12	2.11	1.64	1.94
13-17	2.62	2.85	2.56
18-24	4.86	4.86	3.93
25-34	2.89	4.95	2.68
35-44	3.70	4.5	2.83
45-54	3.83	3.89	2.97
55+	3.78	2.01	2.08

Figure 1: Distribution of Screen time by Content type in various age groups

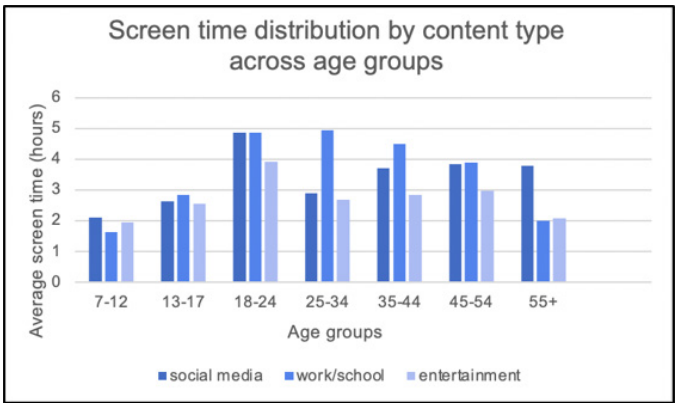


Figure 2: Distribution of screen time by content type in various age groups

Figures 1 and 2 illustrate the distribution of screen time based on content type across different age groups. The variation in content preferences suggests that different types of screen usage may have distinct effects on attention spans. Younger participants (7-12 and 13-17) spent more time on social media and work/school, while the 18-24 engaged most on social media and work/school. Participants aged 25-34, 35-44, and 45-54 engaged mostly in work and school, with those aged 55+ on social media. Young adults (18-24) reported the highest engagement on social media, while work/school-related use peaked within the age group of 18-44. Entertainment-related screen time was highest among young adults (18-24), reflecting academic demands.

Gender	Mean screen time (hours)	Standard deviation
Female	8.56	4.25
Male	7.46	4.21
Others	4.64	2.54

Table 4: Average daily screen time by gender

Table 4 presents the mean daily screen time across different gender groups. Females reported the highest average screen time at approximately 8.56 hours, males averaged 7.46 hours, while those identifying as 'others' averaged 4.64 hours. Males and females reported similar usage, with standard deviations of 4.25 hours and 4.21 hours. These relatively high SDs suggest significant variability in screen time usage. Some individuals within these groups likely have very high or very low screen time compared to average. A lower SD within the 'others' category indicates that screen time usage within this group is more consistent and clustered around the mean.

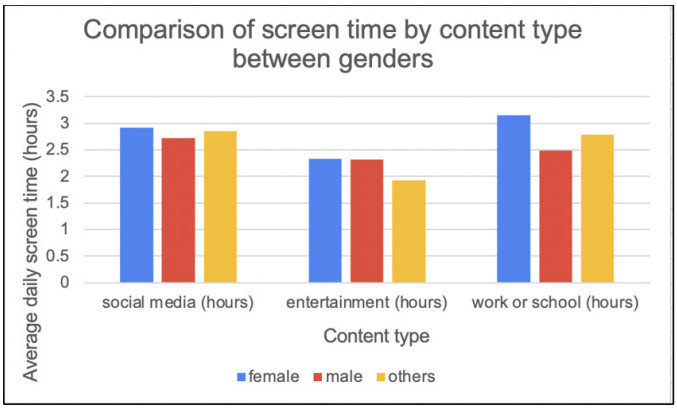


Figure 3: Distribution of screen time by content type in different genders

Figure 3 presents a comparative analysis of average daily screen time across each gender group. The X-axis represents the three main categories: Social Media, Entertainment, and Work/ School, while the Y-axis displays the average hours spent on each activity per day. From the results, male participants spend most of their time on social media, the female participants on work/school, and the 'other' gender category on social media as well. Females exhibit the highest screen time for each category.

SUMMARY

Groups	Count	Sum	Average	Variance
female	181	12468	68.8839779	158.39202
male	138	9654	69.9565217	104.611235
others	7	481	68.7142857	255.904762

ANOVA

urce of Variati	SS	df	MS	F	P-value	F crit
Between Gro	92.8239769	2	46.4119885	0.33780619	0.71358523	3.02368943
Within Groups	44377.7312	323	137.392357			
Total	44470.5552	325				

Figure 4: Gender-based differences in content preferences and attention span

Figure 4 presents the results of a one-way ANOVA analyzing the effect of screen time on attention span across different gender groups. The p-value of 0.71 suggests that there is no statistically significant difference in attention span scores between genders in relation to screen time exposure.

SUMMARY

Groups	Count	Sum	Average	Variance
total	326	2610.5	8.00766871	18.1468641
score	326	22603	69.3343558	136.832478

ANOVA

urce of Variati	SS	df	MS	F	P-value	F crit
Between Gro	613036.896	1	613036.896	7911.2079	0.2534534	3.85580477
Within Groups	50368.286	650	77.4896708			
Total	663405.182	651				

Figure 5: Analysis of How Screen Time Affects Attention Spans

Figure 5 reflects the statistical analysis of the data that revealed no significant correlation between total screen time and attention span scores. The p-value is higher than 0.05, indicating that any observed variations in attention span were likely due to random chance rather than a real effect of screen usage. This suggests that simply spending more time on screens does not inherently weaken or improve attention span.

Further analysis examined whether different types of screen use—social media, entertainment, and work/school—had any effect on attention spans. The results, again, showed no significant differences in attention span scores across participants who primarily used screens for different purposes.

DISCUSSION

Interpretation of Findings

The findings of this study indicate no significant correlation between total screen time and attention span. Similarly, the type of screen use, whether for social media, entertainment, or work/ school-related activities, did not demonstrate a meaningful effect on attention span. The high p-values across analyses suggest that any variations in attention span observed were likely due to random chance rather than a true effect of screen use.

These results contradict common assumptions that longer screen exposure leads to diminished attention spans, particularly in younger populations. While previous research has raised concerns about excessive screen time contributing to issues such as inattention, impulsivity, and cognitive overload, the present study did not find empirical support for these claims. This suggests that the impact of screen time on attention may be more nuanced than previously thought, potentially influenced by individual cognitive differences, environmental factors, and the quality of screen interactions rather than just the duration of use.

One possible explanation for these findings is that attention span is shaped by a multitude of variables beyond screen time alone. Factors such as genetics, lifestyle habits, sleep quality, and learning environments likely play a more dominant role in determining one's ability to focus. For example, a person who spends a large amount of time on screens but also engages in structured cognitive tasks (e.g., reading, problem-solving, or professional work) may have a significantly different attention span than someone who primarily engages in passive screen use (e.g., scrolling on social media without active engagement). These nuances may not have been fully captured in this study.

Another critical aspect to consider is screen multitasking behavior. Some participants may have engaged in single-task screen use (e.g., watching a lecture or reading a long-form article), while others may have been constantly switching between apps, responding to notifications, or watching multiple screens simultaneously. Research suggests that frequent multitasking is more strongly linked to reduced attention span than total screen time alone, but this study did not specifically assess multitasking behaviors.

The lack of significant findings also raises questions about previous research methodologies. Many past studies that have found negative effects of screen time on attention span relied on experimental designs or longitudinal studies, where specific cognitive processes were tested under controlled conditions.

In contrast, this study utilized self-reported survey data, which may not capture real-time cognitive performance as precisely as laboratory-based attention tasks.

Comparison to Previous Research

Previous studies on screen time and attention span have yielded mixed results, with some indicating negative effects, neutral effects, or even cognitive benefits depending on the type of screen engagement.

1. Studies supporting negative effects suggest that prolonged screen time, especially exposure to fast-paced digital content (e.g., short-form videos, video games with rapid scene changes), may condition the brain to seek constant stimulation, reducing the ability to sustain attention on slower-paced tasks such as reading or classroom learning. These studies argue that dopaminergic reinforcement from digital media consumption may contribute to attentional issues, particularly in children and adolescents.
2. Studies supporting neutral or positive effects argue that certain types of screen use, such as educational apps, strategic gaming, or problem-solving tasks, may enhance cognitive abilities rather than impair them. Some research suggests that playing video games or using interactive screen-based learning tools may improve selective attention, working memory, and task-switching ability, particularly in adolescents and young adults.

The present study aligns more closely with research that has found no universal negative effect of screen time on attention. The results support the idea that screen time alone is not a reliable predictor of attentional capacity and that more context-specific factors (e.g., content type, engagement level, and individual cognitive traits) need to be considered.

Limitations of the Study

While this study provides valuable insights into screen time and attention span, several limitations must be acknowledged. These include:

1. Self-Reported Data and Recall Bias

The study relied on self-reported screen time and attention span assessments, which may be subject to inaccuracies. Participants may have misestimated their daily screen use, either overreporting or underreporting based on personal perceptions. Similarly, attention span was measured through self-assessment rather than objective cognitive tests, which may not fully capture real-world attentional performance.

2. Sample Size and Generalizability

Although 326 participants were included, this sample size does not necessarily represent the entire population. The study included participants from various age groups, but there may have been uneven representation across demographics, such as occupation, education level, and digital literacy. The sample may not accurately reflect populations with clinically diagnosed attention disorders (e.g., ADHD), extreme screen users (e.g., esports players or social media influencers), or individuals with minimal screen exposure.

3. Lack of Experimental Control

Unlike controlled experiments, this study did not manipulate screen exposure but rather observed natural screen habits.

Participants may have had different cognitive baselines, meaning some individuals naturally have higher attention spans due to lifestyle or genetic factors unrelated to screen time. The study also did not differentiate between passive vs. active screen use, which may influence attentional outcomes differently.

4. Unmeasured Confounding Variables

Factors such as sleep quality, physical activity, diet, mental health, and environmental distractions could all influence attention span, but these were not controlled for in the analysis. For instance, a participant with high screen time but good sleep habits and exercise routines may have a different cognitive outcome than someone with high screen time and poor sleep patterns.

Given these limitations, the findings should be interpreted with caution and seen as part of a larger conversation about screen use and cognitive function rather than definitive proof of no effect.

CONCLUSION

This study sought to examine the relationship between screen time duration, content type, and context in relation to attention span across different age groups. The results indicated no significant correlation between total screen exposure and attention span, and no meaningful differences between various types of screen use (social media, entertainment, or work/school).

These findings challenge the assumption that more screen time inherently reduces attention span and suggest that screen use alone is not a reliable predictor of cognitive focus. While concerns about digital distraction and overuse remain valid, this study highlights the need to shift the conversation towards understanding the quality of screen engagement rather than just focusing on the quantity of time spent.

Implications for Future Research and Practice

1. Future studies should employ more objective cognitive tests (e.g., sustained attention tasks, reaction time tests) rather than relying solely on self-reported surveys.
2. Investigating screen multitasking behaviors could provide deeper insights into whether frequent task-switching, rather than screen time itself, contributes to reduced attention.
3. Longitudinal studies tracking individuals over time may help determine whether prolonged screen use has cumulative effects on attentional abilities.
4. Further research should explore interactions between screen use and lifestyle factors such as sleep patterns, physical activity, and real-world social engagement.
5. Educators and policymakers should consider screen use quality rather than enforcing strict screen time limits. Instead of outright limiting screen exposure, guidelines could focus on encouraging more mindful and structured screen habits—such as setting designated times for

work and social use, reducing excessive multitasking, and integrating active engagement rather than passive consumption.

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